REMARKS/ARGUMENTS

No new matter has been added by the above amendments, and thus, the Examiner is respectfully requested to enter the amendments.

Objection to specification in item 1 of Office Action.

The amendments to the various paragraphs in the specification are to correct minor, typographical errors, and minor, grammatical errors, in accordance with the Examiner's request in item 1 of the Office Action.

Rejection of claims 18 and 23 under 35 USC 112, first paragraph.

The "%" being changed to "% by weight" in the previous amendment to claims 18 and 23 has been retained in the above Amendment. Applicant respectfully declines to change this back to "%", and traverses the rejection as follows.

As previously mentioned in the response to the prior Office Action, it is well known in the art that the commercial products as purchased are percentages "by weight".

Thus, Applicant respectfully submits that the claims denoting % by weight are sufficiently distinct and comply with the written description requirement.

In connection therewith, Applicant encloses a copy of Mortimer, 5th Edition, *Chemie das Basiswissen der Chemie (Book of Basic Knowledge in Chemistry)*, title page, publication date page, and page 29 (1987) [prior to the December 11, 2002 effective filing date of the subject application 10/707,346]. The Examiner's attention is respectfully directed to the italicized sentence in item 4 of page 29, which states:

> % - angaben beziehen sich, wen nichts gegenteiliges anagegebett ist, immer auf Massenantell.

which translates from German into English as:

> % - specifications refer to a mass proportion, if not stated to the contrary.

Also, Applicant encloses a 2-production paper, dated 11 October 2002 on the top right of the first page and 10 October 2002 on the top right of the second page [both dates being prior to the December 11, 2002 effective filing date of the subject application 10/707,346]. The date is also shown at the bottom line of the second page. The word October is in Greek (OKTШBPΓOU), and most of the paper is in Greek. However, however, the second page of this production paper is partly in Greek and partly in English.

Summarily, the film of Example 1 in the patent application (which is at paragraphs [0045] – [0055] of the patent application as filed) is the same as the film in the production paper, except that the film of Example 1 repeats the EMA blend layer so that there is an EMA blend layer on each side of the PVDC-MA barrier layer for the film of Example 1. More particularly, the production paper shows the *complete composition* of each layer of the film according to Example 1 in the patent application, except that the film of Example 1 is a *symmetric* film repeating layer E from the production paper, composed of an EMA blend, namely EMA (LOTRYL 29MAO3) and EMA (LOTRYL 24MAO005), between what are labeled as layers C and D in the film in the production paper, namely between what are layers 3 and 5 in the film in Example 1. Otherwise, the composition in the production paper is identical to the composition of Example 1.

For instance, the production paper discloses the composition for the outer heat sealing layers 1 and 9 of Example 1 of the patent application, with a thickness of respectively of 20 μ and 19 μ (the well known abbreviation for microns). These outer heat sealing layer are given as layers A and H in both pages of the production paper, with a thickness of respectively of 20 μ and 19 μ. In the production paper, the composition is given in KG (the well known abbreviation for kilograms). Copolymer PL 1880 is added in amount of 25 KG (73.60%), copolymer 1003VN4 is added in an amount of 8 KG (23.60%) and 105E (the slip additive) is added in an amount of 950 g (2.8%). For simplification reasons, these percent amounts are rounded in Example 1 to 74%, 24% and 2%, respectively.

Also, the production paper discloses the composition for the EVA (ELVAX 3165) layers 2 and 8 of Example 1 of the patent application, with a thickness of respectively of 3 μ and 8 μ. These layers are given as layers B and G, with a thickness of respectively of 3 μ and 7.5 μ, in both pages of the production paper.

Also, the production paper discloses the composition for the EVA (ELVAX 3190) layers 3 and 7 of Example 1 of the patent application, with a thickness of respectively of 4 μ and 6 μ (rounded from 7.5 μ). These layers are given as layers C and F, with a thickness of respectively of 4 μ and 4 μ, in both pages of the production paper.

Also, the production paper discloses the composition for the EMA blend ((LOTRYL 29MAO3) and LOTRYL 24MAO005) layers 4 and 6 of Example 1 of the patent application, with a thickness of respectively of 1.5 μ and 1.5 μ. This is given as one layer E, with a thickness of 3 μ,

in both pages of the production paper, and as noted above, the film in the production paper is NOT *symmetric*, whereby there is just one EMA blend layer.

Also, the production paper discloses the composition for the PVDC-MA (XU.32019.10L) barrier layer 5 of Example 1 of the patent application, with a thickness of 5 μ. This is given as barrier layer D, with a thickness of 4.5 μ, in both pages of the production paper

Furthermore, various supplier's technical data sheets are enclosed to show that ELVAX 3190 from DUPONT is ethylene vinyl acetate with 25 % by weight vinyl acetate, ELVAX 3165 from DUPONT is ethylene vinyl acetate with 18 % by weight vinyl acetate, LOTRYL 29 MA 03 from ARKEMA is ethylene methyl acrylate with 27 – 31 % by weight methyl acrylate, LOTRYL 24 MA 005 from ARKEMA is ethylene methyl acrylate with 23 – 26 % by weight methyl acrylate, And EVANTANE 1003 VN4 from TOTAL PETROCHEMICALS is ethylene vinyl acetate with 13.5 % by weight vinyl acetate.

Thus, it would thus be obvious for a person of ordinary skill in the art to know that the amounts are amounts by weight % and not by volume %.

Rejection of claim 23 under 35 USC 112, second paragraph.

The various editorial corrections suggested by the Examiner at the end of item 5, with regard to claim 23, have been effected by the amendment to claim 23.

With regard to the Examiner's objection vis-à-vis abbreviations, such as MFI, being recited in claim 23, and dimensions of density and melt flow index not being recited in claim 23, all the abbreviations have now been spelled out fully, and the dimensions have been inserted.

With regard to the Examiner's objections to trademarks and trade names being recited in claim 23, these have now been deleted.

Allowance of claims 18 and 23.

The Examiner indicated in item 7 of the Office Action that claims 18 and 23 would be allowable if rewritten to attend to the Section 112 rejections. Claims 18 and 23 has been so amended.

Accordingly, the Examiner is respectfully requested to withdraw the Section 112 rejections of claims 18 and 23.

Rejection of claims 1- 22, 24, 25, 27, and 28 under 35 USC 112, second paragraph.

The amendments to claims 1 – 22, 24, 25, 27 and 28 are to attend to the Examiner's rejection under Section 112, second paragraph, in item 5 of the Office Action, as further discussed below.

With regard to the Examiner's objection to the phrase an "ethylene ester" copolymer, Applicant respectfully points out that this term is well known to the person of ordinary skill in the art as meaning copolymers of ethylene with carboxy group containing monomers. Well known examples of "ethylene ester" copolymers, as recited in paragraph [0034] of Applicant's specification, are ethylene vinyl acetate copolymers, ethylene methyl acrylate copolymers, ethylene ethyl acrylate copolymers, ethylene methyl methacrylate copolymers, and ethylene butyl acrylate copolymers.

With regard to the Examiner's objection to improper Markush group phrasing in claims 1, 9, and 18, Applicant respectfully notes that traditional Markush language of:

selected from the group consisting of ___, ___, and ___

now has been employed throughout these claims, and thus, Applicant respectfully submits that it is requisite to employ the connector "and", not the connector "or", at the end of the traditional Markush group.

With regard to the Examiner's objection to the phrase "an alpha-olefin plastomer copolymer" in each of dependent claims 12 and 14, each of which depends on independent claim 1, this phrase has now been reworded as "an ethylene alpha-olefin copolymer that is a plastomer" so that antecedent basis in claim 1 is proper. Ethylene alpha-olefin copolymers that are plastomers are defined in paragraph [0028] of Applicant's specification.

With regard to the Examiner's objection to the phrase "an ethylene-vinyl acetate copolymer" in each of dependent claims 13 and 14, each of which depends on independent claim 1, this phrase has now been reworded as "an ethylene ester copolymer that is an ethylene-vinyl acetate copolymer" so that antecedent basis in claim 1 is proper. Ethylene ester copolymers that are ethylene-vinyl acetate copolymers are defined in paragraph [0034] of Applicant's specification.

With regard to the Examiner's objection to the phrase "such as to improve the machinability or other properties of the film" at the end of claim 19, this phrase has now been deleted from claim 19.

With regard to the Examiner's objection to polymers in the claims sometimes being plural, the polymers in the claims are now recited in singular form.

Rejection of claims 1 - 17, 19 - 22, 24, 25, 27 and 28 under 35 USC 103(a) as being obvious over US Patent 6,146,726 to Yoshii, et al., in view of US Patent 4,909,726 to Bekele and US Patent 6,074,715 to Lind, et al.

Independent claim 1 and all claims dependent back to independent claim 1 have been amended to employ the connector "consisting essentially of" instead of "comprising".

Applicant respectfully reiterates, as is well known in the case law, use of the connector "consisting essentially of" instead of "comprising" excludes whatever would materially change the basic nature of the claimed invention.

With regard to the Examiner's objection to the open language of "at least one layer" in independent claim 1, this claim has been amended by inserting "each layer consists essentially of" and thus, when there is more than one such layer, all of such layers must be the recited polymers.

Accordingly, Applicant respectfully notes that the claims now clearly exclude the film having polyamide, copolyamide, and nylon 6 (a type of polyamide), which are required by US Patent 4,909,726 to Bekele.

Also, Applicant respectfully reiterates, as is well known in the art of plastic packaging films, hot blown films are not heat-shrinkable. Moreover, for the chub application of the present invention, heat shrinkability is not a desirable feature; heat shrinkable film is too expensive and difficult to produce, requiring particular extruders, for an application that does not require heat shrinkability.

Applicant respectfully reiterates that the present application contains comparative data of Applicant's inventive film (Example 1 in the present application), which is *free of polyamide and copolyamide*, versus a comparative film having copolyamide (Example 2 in the present application), clearly showing unexpected superior impact test data at 0° C for Applicant's inventive film as follows:

FILM	**IMPACT TEST DATA**
applicant's inventive film *(free of polyamide and copolyamide)*	450 grms
comparative film *(contains copolyamide)*	210 grms

see particularly, paragraphs [0090] and [0091].

Both US Patent 6,146,726 to Yoshii, et al. and US Patent 6,074,715 to Lind, et al. disclose heat-shrinkable films.

Applicant respectfully notes that in the previous amendment, claim 1 was limited to hot blown films, which are not heat-shrinkable films, as is well known in the art of plastic packaging films.

The Examiner noted at the end of item 8 of the Office Action that Example 5 of US Patent 4,909,726 to Bekele includes longitudinally oriented film. (See, the paragraph at lines 45 – 50 of column 7 of US Patent 4,909,726 to Bekele.)

Applicant respectfully points out that when a film is longitudinally oriented, that only means the film is stretched in the longitudinal direction, and does not mean the film is heat shrinkable.

As is well known to those skilled in the art of film making, simply to stretch a film in the longitudinal direction, i.e., to orient the film longitudinally, does not automatically make that film heat shrinkable.

As is well known to those skilled in the art of film making, heat shrinkable films shrink in *both* the longitudinal and the transverse direction.

More specifically, to make heat shrinkable film requires a particular cool down cycle for cooling the molten film during manufacture, so that when the room temperature film is subjected to heat (such as when a product packaged with the film is passed through a hot water tunnel or a hot air tunnel), the film heat shrinks in *both* the longitudinal and the transverse direction, creating a tight fit about the product.

As is well known in the art, molten film cooled by this particular cool down cycle results in film that is heat shrinkable in *both* the longitudinal and the transverse direction.
Heat shrinkability in only the longitudinal direction of a film would be useless since such a film could not make a tight fit about a product packaged with the film, when the packaged product is passed through a hot water tunnel or hot air tunnel.

As is well known in the art of plastic packaging films, hot blown films are not heat-shrinkable films. Furthermore, as also noted above, for the chub application of the present invention, heat shrinkability is not a desirable feature; heat shrinkable film is too expensive and difficult to produce, requiring particular extruders (that can effect the particular cool down mentioned above for molten film stretched both longitudinally and transversely), for an application that does not require heat shrinkability.

Moreover, both US Patent 6,146,726 to Yoshii, et.al. and US Patent 6,074,715 to Lind, et al. disclose that polyamide and copolyamide are optional, and thus, they teach use of polyamide and

copolyamide makes an equally effective film as use of other polymers. As noted, Applicant's inventive film is *free of polyamide and copolyamide,* and is not a heat-shrinkable film, but rather is a hot blown film.

Hence, contrary to the Examiner's allegation, a combination of documents referring to heat-shrinkable films on the one hand (both US Patent 6,146,726 to Yoshii, et al. and US Patent 6,074,715 to Lind, et al.) and non-heat-shrinkable films containing polyamide, copolyamide, and nylon 6 on the other hand (US Patent 4,909,726 to Bekele), does not suggest or teach the presently claimed invention to the person of ordinary skill in the art.

Thus, although both applicant's inventive film and the film according to US Patent 4,909,726 to Bekele are hot blown films suitable for chub packaging, combining US Patent 4,909,726 to Bekele (requires polyamide and/or copolyamide) into US Patent 6,146,726 to Yoshii, et al. and US Patent 6,074,715 to Lind, et al. (both require heat-shrinkable film and both teach polyamide and copolyamide to be as effective as other polymers) does not render obvious applicant's inventive film.

Accordingly, the Examiner is respectfully requested to withdraw the rejection of claims 1 - 17, 19 - 22, 24, 25, 27 and 28 under 35 USC 103(a) as being obvious over US Patent 6,146,726 to Yoshii, et al., in view of US Patent 4,909,726 to Bekele and US Patent 6,074,715 to Lind, et al.

CONCLUSIONS

In view of the above amendments and remarks, Applicant respectfully requests the Examiner to withdraw all of the rejections under 112, first and second paragraphs, 102(b) and 103(a), and all of the objections to the specification.

Applicant respectfully submits that the application is in condition for allowance, and earnestly solicits notification of allowance.

AUTHORIZATION TO CHARGE DEPOSIT ACCOUNT

Although a $510.00 check is enclosed for the extension fee (small entity) for the 3-month extension of time and thus it is believed that no additional fee is due, the Commissioner is

authorized to charge additional fees which may be required by this paper, or to credit any overpayments, to Deposit Account No. **13-4365**.

Respectfully submitted,

November 30, 2006
(DATE)

(SIGNATURE OF ATTORNEY)

Reg. No.: 30,687
Tel No.: (919) 286-8000

Jennifer L. Skord (Registration No. 30,687)

Moore & Van Allen PLLC
430 Davis Drive, Suite 500
Morrisville, North Carolina 27560

Encls.: Petition for 3-month extension of time
$510.00 check for extension fee (small entity) for 3-month extension
Copy of Mortimer, 5th Edition, *Chemie das Basiswissen der Chemie (Book of Basic Knowledge in Chemistry)*, title page, publication date page, and page 29 (1987)
Copy of 2-production paper (partly in Greek and partly in English), dated 11 October 2002 on top right of first page and 10 October 2002 on top right of second page
Technical data sheet for ELVAX 3190 from DUPONT
Technical data sheet for ELVAX 3165 from DUPONT
Technical data sheet for LOTRYL 29 MA 03 and LOTRYL 24 MA 005 from ARKEMA
Technical data sheet for EVANTANE 1003 VN4 from TOTAL PETROCHEMICALS

Chemie

Das Basiswissen der Chemie

Mit Übungsaufgaben

Charles E. Mortimer

Übersetzt und bearbeitet von Ulrich Müller

5. völlig neu bearbeitete und erweiterte Auflage

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Charles E. Mortimer
Muhlenberg College
Allentown, Pennsylvania/USA

Prof. Dr. Ulrich Müller
Fachbereich Chemie der Universität
Hans-Meerwein-Straße, D-3550 Marburg

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Masse M in Gramm. Die Einheit ist Gramm pro Mol. Formulierung: „Die molare Masse von Natrium beträgt 22,98977 g/mol; kurz: $M(Na) = 22{,}98977$ g/mol; die molare Masse von Wasser beträgt 18,015 g/mol; $M(H_2O) = 18{,}015$ g/mol".

4. Prozentuale Zusammensetzung von Verbindungen

Der prozentuale Massenanteil der Elemente in einer Verbindung kann leicht aus der Formel berechnet werden. Die Indexzahlen in der Formel geben die Anzahl der Mole jedes Elements in einem Mol der Verbindung an. Zusammen mit den molaren Massen der Elemente kann man die entsprechende Masse jedes Elements in Gramm berechnen. Nach Division durch die Molmasse der Verbindung erhält man den *Massenanteil* w des jeweiligen Elements; Multiplikation mit 100 ergibt dann den Prozentgehalt. *%-Angaben beziehen sich, wenn nichts gegenteiliges angegeben ist, immer auf Massenanteile.* Weil dies nicht immer beachtet wird, kann man, um Fehler zu vermeiden, an Stelle einer %-Angabe die eindeutige Bezeichnung Centigramm pro Gramm (cg/g) verwenden.

Beispiel 3.4

Nicotin enthält Kohlenstoff, Wasserstoff und Stickstoff. Wenn 2,50 g Nicotin verbrannt werden, erhält man 6,78 g CO_2, 1,94 g H_2O und 0,432 g N_2. Welche prozentuale Zusammensetzung hat Nicotin?

Aller Kohlenstoff der Probe findet sich in den 6,78 g CO_2, aller Wasserstoff in den 1,94 g H_2O.

$M_r(CO_2) = 44{,}0$; $M_r(H_2O) = 18{,}0$.

Der Kohlenstoffanteil im CO_2 beträgt:

$$w(C) = \frac{n(C) \cdot M_r(C)}{M_r(CO_2)} = \frac{1 \cdot 12{,}0}{44{,}0} = 0{,}273$$

Die Kohlenstoffmasse im CO_2 und damit in der Probe beträgt:

$$m(C) = w(C) \cdot m(CO_2) = 0{,}273 \cdot 6{,}78\ \text{g} = 1{,}85\ \text{g}$$

H-Anteil im H_2O:

$$w(H) = \frac{n(H) \cdot M_r(H)}{M_r(H_2O)} = \frac{2 \cdot 1{,}01}{18{,}0} = 0{,}112$$

$$m(H) = w(H) \cdot m(H_2O) = 0{,}112 \cdot 1{,}94\ \text{g} = 0{,}218\ \text{g}$$

Durch Division mit der ursprünglichen Probenmasse erhält man die Prozentgehalte der Elemente im Nicotin:

$$\frac{m(C)}{m(\text{Nicotin})} \cdot 100\% = \frac{1{,}85\ \text{g}}{2{,}50\ \text{g}} \cdot 100\% = 74{,}0\%\ C$$

$$\frac{m(H)}{m(\text{Nicotin})} \cdot 100\% = \frac{0{,}218\ \text{g}}{2{,}50\ \text{g}} \cdot 100\% = 8{,}7\%\ H$$

$$\frac{m(N)}{m(\text{Nicotin})} \cdot 100\% = \frac{0{,}432\ \text{g}}{2{,}50\ \text{g}} \cdot 100\% = 17{,}3\%\ N$$

$$100{,}0\%$$

Beispiel 3.3

Wie viel Prozent Eisen sind im Eisenoxid Fe_2O_3 enthalten?

Ein Mol Fe_2O_3 enthält:

$n(Fe) = 2$ mol; $n(O) = 3$ mol.

$$m(Fe) = n(Fe) \cdot M(Fe) = 2\ \text{mol} \cdot 55{,}8\ \text{g/mol} = 111{,}6\ \text{g}$$

$$m(O) = n(O) \cdot M(O) = 3\ \text{mol} \cdot 16{,}0\ \text{g/mol} = 48{,}0\ \text{g}$$

$$m(Fe_2O_3) = 159{,}6\ \text{g}$$

Massenanteil des Fe in Fe_2O_3:

$$w(Fe) = \frac{m(Fe)}{m(Fe_2O_3)} = \frac{111{,}6\ \text{g}}{159{,}6\ \text{g}} = 0{,}6993$$

Prozentgehalt des Fe in Fe_2O_3:

$$w(Fe) \cdot 100\% = 69{,}93\% = 69{,}93\ \text{cg/g}$$

Beispiel 3.5

Wie groß ist der Eisengehalt in einem Erz, das zu 70,0% aus Fe_2O_3 besteht?

Zunächst wird der Massenanteil von Fe in Fe_2O_3 berechnet (vgl. Beispiel 3.3), dann werden davon 70,0% genommen:

$$w(Fe) \cdot 70\% = 0{,}699 \cdot 70{,}0\% = 48{,}9\%\ \text{Fe im Erz}$$

Κάρτες θ 74/66

(2)

ΔΕΛΤΙΟ ΠΑΡΑΓΩΓΗΣ ΠΛΑΣΤΙΚΟΥ

ΠΕΛΑΤΗΣ: FLEXOPACK ON: 40083 11/10/2002

ΚΩΔΙΚΟΣ: 60999999 122

ΔΙΑΣΤΑΣΕΙΣ: 74x2/66+2 108+3/66 ΠΛΑΤΟΣ:1500mm Πρόχθη 300 φ

ΠΟΣΟΤΗΤΑ: 100 ΡΟΛΛΑ: 2 ΜΕΤΡΗΤΗΣ: 1000m

ΥΛΙΚΑ

			ΠΟΣΟΤΗΤΑ	ΠΟΣΟΣΤΟ %
ΚΟΧΛΙΑΣ A	PL1880		25,000	73,60%
	1003VN4		8,000	23,60%
	105E		0,950	2,80%
	AMPACET 100031			2%
ΚΟΧΛΙΑΣ B	ELVAX 3165			100,00%
ΚΟΧΛΙΑΣ C	ELVAX3190			100,00%
ΚΟΧΛΙΑΣ D	XU.32019.10L			100,00%
ΚΟΧΛΙΑΣ E	29MAO3		25,000	70%
	24MAO005		10,700	30%
ΚΟΧΛΙΑΣ F	ELVAX3190			100,00%
ΚΟΧΛΙΑΣ G	ELVAX3165			100,00%
ΚΟΧΛΙΑΣ H	PL1880	0,902	25,000	73,60%
	1003VN4	0,935	8,000	23,60%
	105E	0,98	0,950	2,80%
	ABPACET 100031			2%

ΚΟΧΛΙΑΣ	ΣΤΡΟΦΕΣ	ΠΥΚΝΟΤΗΤΑ	gr/m	ΣΤΙΒΑΔΕΣ
A		0,912		20
B		0,94		3
C		0,95		4
D		1,7		4,5
E		0,947		3
F		0,95		~~4~~ 6
G		0,94		~~7,5~~
H		0,912		20
				66

ΤΑΧΥΤΗΤΑ: ΤΡΑΝΤΑΡΙΣΜΑ:

D152

(R-D DIRECTION)
2002

Ημερομηνία : 10 Οκτωβρίου,

Σελ. 1/1

cc:

FLEXOPACK A.E.

ΟΔΗΓΙΕΣ ΓΙΑ ΤΗΝ ΠΑΡΑΓΩΓΗ ΝΕΟΥ ΠΡΟΙΟΝΤΟΣ

INSTRUCTIONS FOR NEW PRODUCT DESIGN

E 4.0.1

ΠΕΛΑΤΗΣ (CUSTOMER) FLEXOPACK, 60-999999 122
ΕΠΑΦΗ ΜΕ (CONTACT PERSON) :

ΠΛΗΡΟΦΟΡΙΕΣ(INFORMATION) : FLEXOPACK ~~50~~ 65 MICRONS-ΑΜΕΡΙΚΗ

ΣΤΑΔΙΑ ΠΑΡΑΓΩΓΗΣ (PRODUCTION STAGES) : EXTRUSION
ΜΗΧΑΝΗ (MACHINE) :
ΠΛΑΤΟΣ (WIDTH) : 740*2=1480 MM ΜΗΚΟΣ (LENGTH) : 100 KILOS ΤΡΕΑΤΜΕΝΤ:
ΣΥΝΟΛΙΚΟ ΠΑΧΟΣ (TOTAL THICKNESS) : 65 MICRONS

LAYER	ΥΛΙΚΑ (MATERIALS)	ΠΑΧΟΣ (μ) (THICKNESS)
A	25 KG PL 1880+ 8 KG 1003 VN4+ 950 GR FSU 105E	20
B	ELVAX 3165	3
C	~~50%~~ ELVAX 3190+ ~~50% ELVAX 3175~~	4
D	PVDC	4.5
E	LOTRYL 29MAO3 70/30	3
F	~~50%~~ ELVAX 3190+ ~~50% ELVAX 3175~~	4
G	ELVAX 3165	7.5
H	25 KG PL 1880+ 8 KG 1003 VN4+ 950 GR FSU 105E	19

Παρατηρήσεις(REMARKS) ΝΑ ΔΟΥΜΕ ΚΑΙ ΤΗ ΔΥΝΑΤΟΤΗΤΑ COLLAPSE ΔΟΜΗΣ

Διεύθυνση Σχεδιασμού & Ανάπτυξης
(R-D DIRECTION)
2002

Ημερομηνία : 10 Οκτωβρίου,

DuPont™ Elvax® 3190

Description

Generic Name	Ethylene Vinyl Acetate
Product Description	DuPont™ Elvax® 3190 is an extrudable ethylene-vinyl acetate copolymer resin available in pellet form for use in conventional extrusion equipment designed to process polyethylene resins.

Product Characteristics

Processing Method	• Extrusion
Typical Applications	This resin is designed to provide a low temperature heat seal to itself or many other materials commonly used in flexible packaging applications. The melt properties of this resin allow it to be processed on blown film equipment over a wide range of film thickness and blow-up ratios. It can also be coextruded with a variety of other polymers. This resin is typically used as low temperature seal layer in coextruded films.
Material Status	• Commercial: Active
Availability	• not yet determined
Composition	• 25 %, By Weight, Vinly Acetate • BHT antioxidant
Features	• Copolymer
Uses	• not yet determined
Manufacturer / Supplier	• DuPont Packaging & Industrial Polymers

Properties

Physical	Nominal Values	Test Method
Density	0.95g/cm³	ASTM D792 - ISO 1183
Melt Index (190°C/2.16kg)	2g/10 min	ASTM D1238 - ISO 1133
Thermal	**Nominal Values**	**Test Method**
Vicat Softening Point	52°C (126°F)	ASTM D1525 - ISO 306
Melting Point	77°C (171°F)	ASTM D3417
Freezing Point	55°C (131°F)	ASTM D3417

Processing Information

General Processing Information	Elvax® can be used in conventional extrusion equipment designed to process polyethylene resins. However, corrosion-protected barrels, screws, adapters, and dies are recommended, since, at sustained melt temperatures above 446°F (230°C), ethylene vinyl acetate (EVA) resins may thermally degrade and release corrosive by-products.
General Processing Information	Resin melt temperature should be maintained in the range of 175 - 215°C (350 - 420°F) to provide a suitable viscosity and melt strength for coextrusion in either blown film or cast film applications. Selection of a specific melt temperature will depend on considerations such as desired gauge, desired optical properties, chill roll surface and heat transfer characteristics, tension control, and other machine variables.
FDA Status	ELVAX® 3190 EVA Resin complies with Food and Drug Administration Regulation 21 CFR 177.1350(a)(1) - - Ethylene-vinyl acetate copolymers, subject to the limitations and requirements therein. This Regulation describes polymers that may be used in contact with food, subject to the finished food-contact article meeting the extractive limitations under the intended conditions of use, as shown in paragraph (b)(1) of the Regulation.
Safety & Handling	A Product Safety Bulletin, Material Safety Data Sheet, and more detailed information on compounding and processing Elvax® resins for specific applications are available from your DuPont Packaging and Industrial Polymers representative.

Read and understand the Material Safety Data Sheet (MSDS) before using this product

DuPont Worldwide

Asia Pacific
DuPont Singapore PTE Ltd.
1 Maritime Square #07-01
World Trade Centre
Singapore 0409
Telephone 65-273-2244
Fax 65-272-7494

Australia
DuPont (Australia) Ltd.
254 Canterbury Road
Bayswater, Victoria 3153
Australia
Telephone 3-9721-5900
Fax 3-9721-5650

Brazil/South America
DuPont do Brasil, S.A.
Alameda Itapecuru, 506
06454-080 Barueri, SP Brasil
Telephone 5-11-74166-8542 / 8393
Fax 55-11-4166-8720

Canada
DuPont Canada Inc.
P.O. Box 2200, Streetsville
7070 Mississauga, Road
Mississauga, ONT L5M 2H3
Telephone (Canada Only):
800-268-3943 /
905-821 5953
Fax 905-821-5230

Europe
DuPont de Nemours Int'l.
S.A.
2, Chemin du Pavillon Box 50
CH-1218 Le Grand Saconnex
Geneva, Switzerland
Telephone 022-717-51-11
Fax 022-717-55-00

Japan
Mitsui-DuPont
Polychemicals Co., Ltd.
Kasumigaseki Bldg. 24F
3-2-5 Kasumigaseki
Chiyoda-ku, Tokyo 100, Japan
Telephone 813-3580-5531
Fax 813-3592-1540

Mexico/Central America
DuPont, S.A. de C.V.
Homero 206 Anexo Planta Alta
Col. Chapultepec Morales
11570, D.F. Mexico
Telephone 52-55-57-22-1000
Fax 52-55-57-22-1308

United States
DuPont Packaging and
Industrial Polymers
Barley Mill Plaza 26-2122
Lancaster Pike & Route 141
P.O. Box 80026
Wilmington, DE 19880-0026
Telephone 302-774-1161
Toll-free (USA) 800-438-7225
Fax 302-999-4399

http://www.dupont.com/
info@dupont.com

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This data sheet is effective as of 7/10/2004, and supersedes all previous versions.

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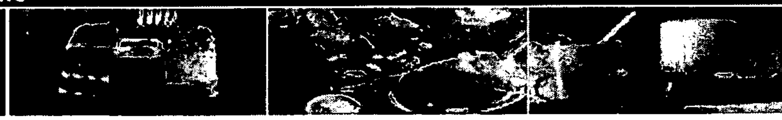
Elvax® resins



DuPont™ Elvax® 3165

Description

Generic Name	Ethylene Vinyl Acetate
Product Description	DuPont™ Elvax® 3165 is an extrudable ethylene-vinyl acetate copolymer resin available in pellet form for use in conventional extrusion equipment designed to process polyethylene resins.

Product Characteristics

Processing Method	• Extrusion
Typical Applications	This resin is designed to provide a low temperature heat seal to itself or many other materials commonly used in flexible packaging applications. The melt properties of this resin allow it to be processed on blown film equipment over a wide range of film thickness and blow-up ratios. It can also be coextruded with a variety of other polymers. This resin is typically used as low temperature seal layer in coextruded films.
Material Status	• Commercial: Active
Availability	• not yet determined
Composition	• 18 %, By Weight, Vinyl Acetate • BHT antioxidant
Features	• Copolymer
Uses	• not yet determined
Manufacturer / Supplier	• DuPont Packaging & Industrial Polymers

Properties

Physical	Nominal Values	Test Method
Density	0.94g/cm³	ASTM D792 - ISO 1183
Melt Index (190°C/2.16kg)	0.7g/10 min	ASTM D1238 - ISO 1133
Thermal	**Nominal Values**	**Test Method**
Vicat Softening Point	69°C (156°F)	ASTM D1525 - ISO 306
Melting Point	89°C (192°F)	ASTM D3417
Freezing Point	68°C (154°F)	ASTM D3417

Processing Information

General Processing Information	Resin melt temperature should be maintained in the range of 150–205°C (300–400°F) to provide a suitable viscosity and melt strength for blown film extrusion. Higher temperatures may be more appropriate for coextrusion with other grades. Selection of a specific melt temperature will depend on considerations such as desired gauge, height of tower, cooling capacity, extruder hold up time, winding conditions, and other machine variables.
General Processing Information	Elvax® can be used in conventional extrusion equipment designed to process polyethylene resins. However, corrosion-protected barrels, screws, adapters, and dies are recommended, since, at sustained melt temperatures above 446°F (230°C), ethylene vinyl acetate (EVA) resins may thermally degrade and release corrosive by-products.
FDA Status	ELVAX® 3165 EVA Resin complies with Food and Drug Administration Regulation 21 CFR 177.1350(a)(1) – – Ethylene-vinyl acetate copolymers, subject to the limitations and requirements therein. This Regulation describes polymers that may be used in contact with food, subject to the finished food-contact article meeting the extractive limitations under the intended conditions of use, as shown in paragraph (b)(1) of the Regulation.
Safety & Handling	A Product Safety Bulletin, Material Safety Data Sheet, and more detailed information on compounding and processing Elvax® resins for specific applications are available from your DuPont Packaging and Industrial Polymers representative.

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DuPont Worldwide

Asia Pacific
DuPont Singapore PTE Ltd.
1 Maritime Square #07-01
World Trade Centre
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Telephone 65-273-2244
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Bayswater, Victoria 3153
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Canada
DuPont Canada Inc.
P.O. Box 2200, Streetsville
7070 Mississauga, Road
Mississauga, ONT L5M 2H3
Telephone (Canada Only): 800-268-3943 / 905-821 5953
Fax 905-821-5230

Europe
DuPont de Nemours Int'l. S.A.
2, Chemin du Pavillon Box 50
CH-1218 Le Grand Saconnex
Geneva, Switzerland
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Japan
Mitsui-DuPont Polychemicals Co., Ltd.
Kasumigaseki Bldg. 24F
3-2-5 Kasumigaseki
Chiyoda-ku, Tokyo 100, Japan
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Toll-free (USA) 800-438-7225
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http://www.dupont.com/
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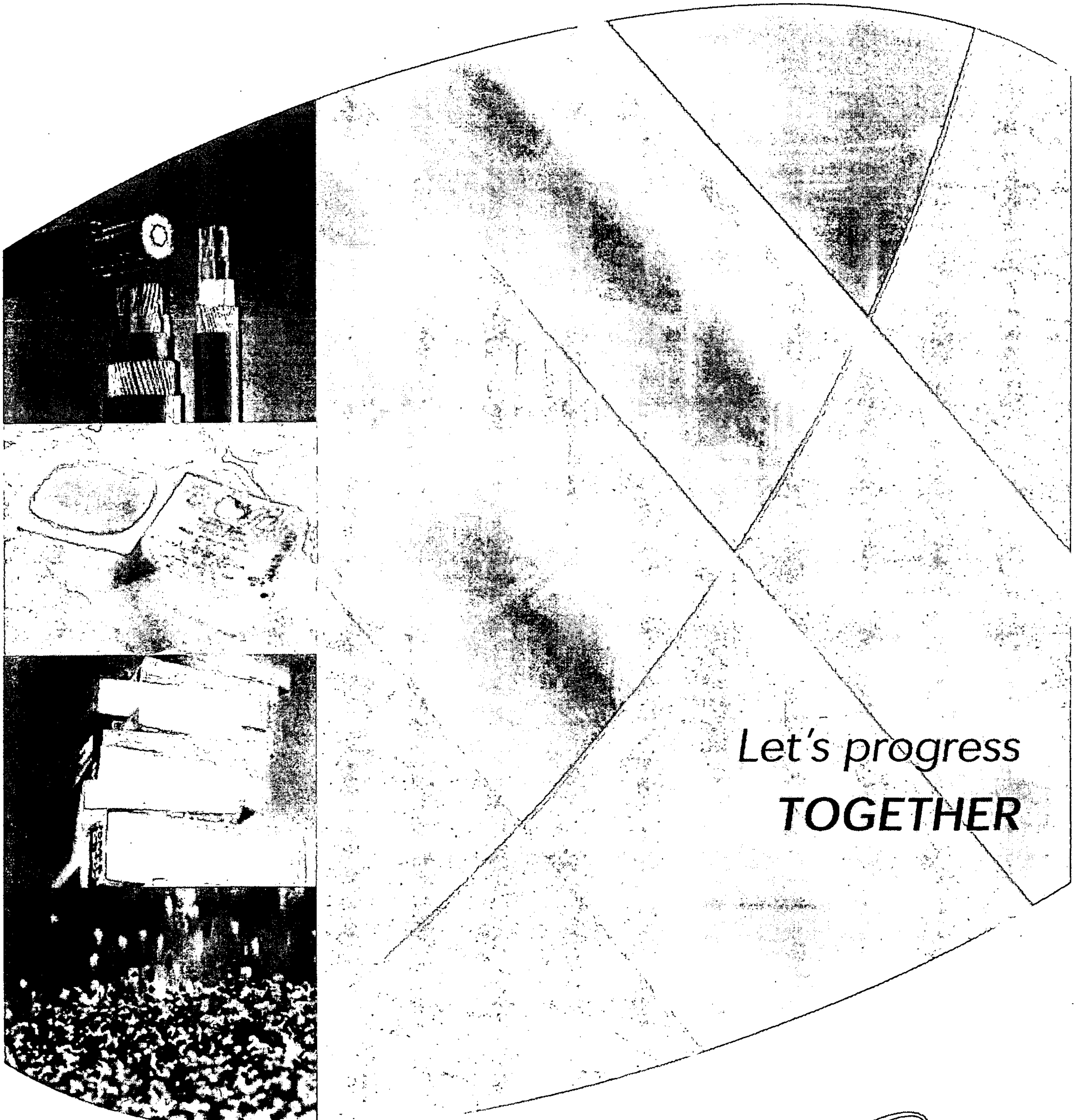
LOTRYL®

COPOLYMERS ETHYLENE - ACRYLIC ESTER



ARKEMA

LOTRYL® COPOLYMERS ETHYLENE - ACRYLIC ESTER

Bases	Grades	Specified properties*		Typical properties									Main applications									
		Ester content	Melt index	Melting point	Vicat Point	Ring and ball temperature	Tensile strenght at break	Elongation at break	Flexural modulus	Hardness		Density	Films	Sheets	Coating	Hygiene	Hot melts	Compounds		Foams	Profiles
		(%)	(g/10 min)	(°C)	(°C)	(°C)	(Mpa)	(%)	(MPa)	Shore A	Shore D	(g/cm³)						Cables	Others		
EBA	7 BA 01	6 - 8	1.0 - 1.5	107	86		17	700	85		42	0.93	●			●					●
	17 BA 04	16 - 19	3.5 - 4.5	93	60		15	700	45		32	0.93	●		●	●		●	●	●	●
	17 BA 07	16 - 19	6.5 - 8.0	89	58		14	700	40		30	0.93	●		●	●		●	●	●	
	28 BA 175	26 - 30	150 - 200	80	40	94	3	750	23	80		0.93					●	●	●		
	30 BA 02	27 - 32	1.5 - 2.5	78	41	>190	6	850	9	75		0.93	●	●		●		●	●		●
	35 BA 40	32 - 37	35 - 45	66	< 40	110	2	300		70		0.93					●		●	●	
	35 BA 320	32 - 37	260 - 350	65	< 40	85	1.5	200		52		0.93					●				
EMA	9 MG 02	8 - 11	1.8 - 2.6	99	77		16	750	88.5		38	0.93	●			●			●		●
	14 MGC 02	12 - 15	2 - 3	92	65		15	800	77	93	30	0.94	●			●					●
	15 MA 03	13 - 17	2.3 - 3.3	89	59		14	700	50		29	0.94	●		●	●		●	●	●	●
	16 MA 003	14 - 18	0.25 - 0.35	88	64		20	650	60		35	0.94	●	●				●			●
	18 MA 02	17 - 20	2 - 3	83	53		13	700	50		25	0.96	●		●	●			●	●	●
	20 MA 08	19 - 22	7 - 9	80	46		9	800	20	83		0.94	●		●	●			●		
	20 MBG 08	18 - 21	7 - 9	80	48		10	800	20	83		0.94	●								
	24 MA 005	23 - 26	0.4 - 0.6	72	45		17	750	18	84		0.94	●	●			●	●	●		●
	28 MA 07	26 - 30	6 - 8	65	< 40	150	7	900	10	76		0.95	●		●	●	●		●	●	
	29 MA 03	27 - 31	2.0 - 3.5	61	< 40	175	6	900	8	75		0.95	●	●		●	●	●	●	●	●
EHA	37EH175	35 - 39	150 - 200	73	< 40	93	2	100	5	71		0.91					●				
	37EH550	35 - 39	450 - 650	72	< 40	82	1.5	50*	6	62		0.91					●				
Test Method		FTIR	ASTM D 1238	D.S.C.	ASTM D 1525	ASTM E 28	ASTM D 638		ASTM D 790	ASTM D 2240		ASTM D 1505	MG - MBG: antiblock + slip agents								
ISO STANDARD		8985	1133	11357.01	306		R 527		178	868		R 1183									

(*) Properties routinely measured during the standard quality control procedure.

[redacted]

OTR grades are supplied in pellet form. OTR is packaged in 25 kg PE bags and deli ered on pallets (1.375 kg net.). Others types of packaging could be offered upon re uest.

[redacted]

In order to use our products safely, please consult OTR safety data sheets.

[redacted]

The composition of OTR products usually complies ith the re uirements of European and American regulations for their use in food contact:

- E.C.: Directi e 2002/72 for monomers and additi es.
- Belgium, France, Italy, The Netherlands, Spain (for both types EBA and EMA).
- Germany: Bg VV Empfehlung V (for EBA - Copolymer ith Ba content > 20%)
  Mischpolymeriesate aus thylen, Propylen, Vinylestern und unges ttigten aliphatischen S uren so ie deren Sal en und Estern.
- SA: FDA 21 CFR 175/105 Adhesi es
  177-1340 Ethylene methyacrylate copolymer resins (only 9 MA 02, 14 MGC 02, 15 MA 03, 16 MA 003, 18 MA 02, 20 MA 08, 20 MB 08 and 24 MA 005).

Due to the e olution of regulations or existing specific restrictions, it is necessary before any usage in food contact to re uest the related certificates from our commercial representati es. Ho e er, e point out that is the duty of the end user to check, in accordance ith professional practice, the reciprocal compatibility of the material and the packed foodstuffs and also that organoleptic characteristics of the latter remain constant.

A global chemical player, Arkema consists of 3 coherent and balanced business segments:
- Vinyl Products: Chlorochemicals and PVC, Vinyl Compounds, Pipes and Profiles,
- Industrial Chemicals: Acrylics, PMMA, Thiochemicals, Fluoro-chemicals, Hydrogen Peroxide,
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ARKEMA

Arkema
4/8, cours Michelet - 92800 Puteaux (France)
Tel.: 33 (1) 49 00 80 80 - Fax: 33 (1) 49 00 83 96
www.arkemagroup.com

www.lotryl.com

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TOTAL PETROCHEMICALS

EVA COPOLYMER
EVA 1003 VN 4

Technical data sheet
Ethylene Vinyl Acetate Copolymer
Blown Film

DESCRIPTION >>

EVA Copolymer made by high pressure tubular process.

Grade for flexible, very transparency and outstanding properties.

Application examples : High strength stretch film, green house film, film for food packaging (coextrusion).

PHYSICAL PROPERTIES >>

Property	Method	Unit	Value
Melt index (2.16 kg)	EN ISO 1133	g/10min	0.4
VA Content	Total Petrochemicals	%	13.5
Melting Point	EN ISO 11357	°C	96
Vicat temperature	ISO 306	°C	73
Density	ISO 1183	g/cm3	0.935

VA Content and Melt Index are properties routinely measured during the standard quality control procedure. Other figures are average values generated by tests not included in the "standard quality control procedure", given for information only.

PROCESSING >>

Advised temperature profile : 150 to 180°C

Possible range of film thickness : 30 to 300 µm depending on extrusion conditions.

MECHANICAL PROPERTIES >>

Property	Method	Unit	Value
Tensile Strength at Yield	ISO 527-2	MPa	6
Tensile Strength at Break	ISO 527-2	MPa	25
Elongation at Break	ISO 527-2	%	800
Elastic modulus	ISO 527-2	MPa	80
Dart test (film 50 µm)	ISO 7765-1	g	800

Mechanical properties measured on a moulded plaque, excepted dart.

Extrusion conditions : 45 mm screw diameter, L/D = 30, die diameter = 120 mm, die gap = 1.4 mm, BUR = 2.5 : 1, temperature = 180°C

ADDITIVES >>

Antioxidant : Yes

FOOD STATUS >>

The composition of EVA 1003 VN 4 complies with the requirements of European and American regulations for food contact. Specific certificates can be obtained on request

DISCLAIMER

Information contained in this publication is true and accurate at the time of publication and to the best of our knowledge. The nominal values stated herein are obtained using laboratory test specimens. Before using one of the products mentioned herein, customers and other users should take all care in determining the suitability of such product for the intended use. Unless specifically indicated, the products mentioned herein are not suitable for applications in the pharmaceutical or medical sector. The Companies within TOTAL PETROCHEMICALS do not accept any liability whatsoever arising from the use of this information or the use, application or processing of any product described herein. No information contained in this publication can be considered as a suggestion to infringe patents. The Companies disclaim any liability that may be claimed for infringement or alleged infringement of patents.

TOTAL
TOTAL PETROCHEMICALS RESEARCH FELUY
Polyethylene Technical Services
Zone Industrielle C
B-7181 Feluy
Belgium

Last updated: 11/10/2004
Contact: Isabelle Di Silvestro
Email: felr-pe-ts-d@total.com
Web : www.polyethylene.totalpetrochemicals.biz